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(3) Initials of the Referencer

MADRAS RECORD OFFICE

Government of Madras

Public Work DEPARTMENT

G.O. No. 3398-99 (9) Press
~~B.P. No.~~ ~~Mis.~~

Dated 13. 12. 1876.

Not to be folded or roughly handled

13 1

Proceedings of the Madras Government, Public Works Department,
13th December 1876. No. 3,399.

Read the following papers:—

No. 316. From Major-General W. A. CROMMELIN, R.E., Officiating Secretary to the Government of India, Public Works Department, (Civil Works—Irrigation,) to Major-General G. W. WALKER, R.E., Secretary to the Government of Madras, Public Works Department, dated Simla, 2nd November 1876, No. 470 I.

I AM directed to acknowledge receipt of your letter, No. 1,620, of the 27th June, and enclosures regarding the Perryaur Project in the Madura District; and to reply that even if full and reliable data for this project were now available, the Government of India is not at present in a position to undertake it.

2. The interval that must elapse before the investigation by the Revenue Officers of the question of probable returns can be completed, and before the project can be finally dealt with by the Government of India; might, if His Grace the Governor in Council thinks it advisable, be taken advantage of to depute an officer to Europe and America to inquire into facts in reference to dams constructed or projected in other countries under exceptional conditions; to visit the works or confer with practical Engineers acquainted with such works, and to report to the Government of India fully the result of his inquiries and observations; and I am to suggest that Captain Pennycuick, who appears to have given this project intelligent attention, might be selected for this duty and deputed at once to England.

3. With reference to paragraph 3 of your letter, I am to point out that before a final decision can be come to as to the design for the dam, it will be necessary to ascertain not only what is "believed" to be, but what actually is, the nature and condition of the underlying rock at the site.

No. 317. MEMORANDUM.

THE existence of sound rock at a moderate depth below the surface of the ground at No. 4 site was, it is believed, conclusively proved.

2. Natural rock undoubtedly exists in the bed of the Perryaur river at the bund site, and it also appears in the bed of the stream below the escape saddle.

3. The first trial pits that was sunk were intended to determine whether there was sound rock in the little hill on which the north end of the bund rests. This small hill is connected with the high hills to the north of the river by the saddle in which it is proposed to cut the escape. To this end pits were sunk for a considerable distance up the main hill across the escape saddle and on to the top of the small detached hill. In all of these good rock was found.

4. It may here be observed that, with one exception, sound rock was never considered to have been reached, unless the pits had been sunk through some feet of water before reaching the rock. Of the whole number of pits sunk only a very small number were considered to have got down to rock. Numbers of pits were stopped by large boulders; in others, although sound rock appeared to have been reached, its level did not agree with that of the rock in the adjacent pits, and it was therefore rejected; in others the rock at the bottom of the pit was not sound, although it was too hard to sink further through.

5. The exception noted in paragraph 3 was in the case of the pits on the top of the small detached hill. Hard rock was apparently reached, and its level agreed with that of the rock found in the pits on both the saddle and on the river side of the hill, but there was no water overlying it. Eventually Mr. Smith, the Executive Engineer in charge, gave orders that a very large pit should be sunk on the summit of the hill; its bottom dimensions were, it is believed, 20 feet × 10 feet, and as the whole surface of the rock thus exposed appeared to be sound when struck with a heavy crowbar it was taken to be true rock.

6. Trial pits were sunk down the whole length, and on both sides of the little stream running from the escape saddle, and rock was found to exist the whole way below the escape into the deep bed of the Perryaur river, and also at the sides of the valley.

7. On each side of, and parallel to, the bed of the Perryaur a very large number of pits were sunk in long parallel lines, in order that a regular contoured survey of the surface of the rock might be made. From this survey the tunnel proposed for the escape of the river water during the construction of the bund was laid out.

8. At the time that these pits were sunk, it was supposed that the tunnel would be designed on the north side of the river; and consequently many more pits were sunk on the north than on the south side. When it was eventually decided to have the tunnel on the south bank, it was too late in the season to sink more pits. The existence of rock at, or very near, the level given on the south bank is, it is believed, proved beyond a doubt.

9. In the event of the work ever being carried out, as it is absolutely necessary that there should be a certain thickness of solid rock above the escape tunnel to withstand the great internal pressure, it would appear to be only a safe precaution before commencing the boring of the tunnel to have the upper surface of the rock immediately above the tunnel exposed throughout its entire length. It is possible that there might be some sudden dip or fault in the rock between two of the trial pits, whose existence, were this precaution not adopted, might only be discovered by the bursting of the tunnel during the construction of the bund—an event which could not fail to be most disastrous.

10. It is believed that the main points of this memorandum are correct, although it is neither as full nor as definite as might be desired. It is nearly five years since the writer sunk most of the pits referred to, and at the present time he is not in possession of a single note or paper referring to the work.

KOTAPATAM,
27th November 1876.

(Signed) C. C. RAWSON, Lieut., R.E.,
Asst. Engineer in charge
2nd Division, East Coast Canal.

No. 318. ORDER THEREON, 13th December 1876, No. 3,398.

IRRIGATION, No. 28-A.

LIEUTENANT RAWSON'S memorandum having furnished all the information regarding the rock at the proposed site for the dam across the Perryaur which can be obtained without a special investigation;

Proceedings of the Madras Government, Public Works Department,
13th December 1876. *No.* 3,399.

and a further examination of value being impracticable without arrangements for clearing jungle and conducting boring operations, which would necessarily be costly, His Grace the Governor in Council resolves to transmit a copy of these Proceedings to the Secretary of State with a request that Captain Pennycuick, who is now in England on furlough, may be deputed to make the inquiries suggested by the Government of India. A complete file of the printed papers appertaining to the Perryaur Project will be transmitted for Captain Pennycuick's use, together with such a selection from the drawings as will enable him to make his report complete.

2. A copy of these Proceedings will be forwarded for the information of the Government of India.

(True Extract.)

(Signed) G. W. WALKER, Major-General, R.E.,
Secretary to Government.

No. 319. (Docket, No. 3,399, dated 13th December 1876.)

Copy of the above forwarded to the Government of India.

(True Extract.)

Major-General, R.E.,
Secretary to Government.

Exd. E. C. Shunker.
Spare Copies

5

Letter from the Government of India, No. 470-I. Of 2d November 1876.

FOR ORDERS.

I would employ Penny quick who is on furlough on this interesting investigation — He may be able to decide the Periyar construction question & will certainly collect most valuable information

WM

[illegible] Lt. Col. R.E.
Joint Secretary to Govt. P. W. D.

I agree — but the nature of the underlying rock should be known & ascertained first as otherwise the calculations may escape being sound on points of importance

in his enquiry —

I must suggest that at the [illegible] [illegible] leave for health — Capt P. examine site & then proceed to other Cases

H.C. 7/11

Captain Pennycuick is now in England.

[illegible]

Report on the nature of the Rock has subsequently been obtained from Lt. Ransom R.E. —

[illegible]

No 1/2 Memorandum — 8° 7^2

1. The existence of sound rock at a moderate depth below the surface of the ground at Number 4 site; was, it is believed, conclusively proved —

2. Natural rock undoubtedly exists in the bed of the Periyaur river at the bund site — and it also appears in the bed of the stream below the escape saddle —

3. The first trial pits that were sunk were intended to determine whether there was sound rock in the little hill on which the north end of the bund rests — this small hill is connected with the high hills to the north of the river by the saddle in which it is proposed to cut the escape. To this end pits were sunk for a considerable distance up the main hill, below the escape saddle, and on the top of the small detached hill — In all of these good rock was found —

4. It may here be observed that with one exception, sound rock was never considered to have been reached unless the pits had been

sunk through some feet of water before reaching the rock — Of the whole number of pits sunk only a very small number were considered to have got down to rock — Numbers of pits were stopped by large boulders — in others, although sound rock appeared to have been reached, its level did not agree with that of the rock in the adjacent pits, and it was therefore rejected — in others, the rock at the bottom of the pit was not sound although it was too hard to sink further through —

5. The exception noticed in para. 3 was in the case of the pits on the top of the small detached hill — Hard rock was apparently reached — and its level agreed with that of the rock found in the pits on both the saddle and on the river side of the hill — but there was no water over lying it — Eventually Mr Smith the Executive Engineer in charge, gave orders that a very large pit

should be sunk on the summit of the hill — its bottom dimensions were, it is believed, 20' x 10' — and as the whole surface of the rock thus exposed, appeared to be sound, when struck with a heavy crow bar it was taken to be true rock —

6. Trial pits were sunk down the whole length, and on both sides of the little stream running from the escape saddle — and rock was found to exist the whole way below the escape into the deep bed of the Penganga River — and also at the sides of the valley —

7. On each side of, and parallel to the bed of the Penganga a very large number of pits were sunk in long parallel lines, in order that a regular contoured survey of the surface of the rock might be made. From this survey the tunnel purposed for the escape of the river water during the construction of the bund, was laid out —

8. At the time that these pits

were sunk, it was supposed that the tunnel would be discoursed on the North side of the River; and consequently many more pits were sunk on the North than on the South side —

When it was eventually decided that the tunnel on the South bank, it was too late in the season to sink more pits — the existence of rock at, or very near the level given on the South bank is, it is believed proved beyond a doubt —

9. In the event of the work ever being carried out, as it is absolutely necessary that there should be a certain thickness of solid rock above the whole tunnel to withstand the great internal pressure — It would appear to be only a safe precaution, before commencing the boring of the tunnel, that the upper surface of the rock

immediately above the tunnel exposed throughout its entire length — It is possible that there might be some sudden dip or fault in the rock between two of the trial pits, whose existence, were this precaution not adopted, might only be discovered by the bursting of the tunnel during the construction of the Canal — an event which could not fail to be most disastrous —

10. It is believed that the main points of this Memorandum are correct, although it is neither as full nor as definite as might be desired — It is nearly six years since the writer sunk most of the pits referred to, and at the present time he is not in possession of a single note or paper referring to the work —

C. J. Lawson
Lieut. R.E.
Asst. Engineer in charge
3rd Division. East Coast Canal.

Kurtiapatam
29' November 1876.

CHIEF ENGINEER
30 NOV
1876
FOR IRRIGATION

R 39 Ir. D

Lt Ransom's Memo

d 27 Novr/76

G.O. 13th Decr/76 No 3398

No 317

P. W. Dept.

17

To,

The Most Hon'ble the

Secretary of State for India.

My Lord Marquis,

We have the honor to transmit for the consideration of your Lordship a copy of our Proceedings as per margin containing our resolution on a suggestion made by the Government of India that an Officer should be deputed to obtain special information in Europe and America regarding dams which have been constructed

or

Is it possible to do anything pending decision on proposed reorganization [illegible] [illegible] [illegible] [illegible] 12/12

No. dated

12/12

or projected under exceptional conditions; and we would recommend Captain Pennycuick R.E., who is now in England on furlough, and who has already been employed for a considerable period on investigations in connection with the Perryaur project, for this important duty.

2. We transmit a complete file of the printed papers, and a selection from the Plans relating to this project for Captain Pennycuick's use, should your Lordship decide to employ him on the investigations. A list of these papers is

11

is enclosed.

19

Amt W.4.7/12

Hon W. A. Elliot C.S.
His Grace the Governor
Hon Sir W. Robinson K.C.S.I.

Transmitting copy of Proceedings on a suggestion of the Govt of India to depute ~~Cap.~~ an Officer to obtain certain information regarding dams in America & Europe and recommending Capt. Pennycuick now in England for the duty

No 3398 Public Works Department.

21

PROCEEDINGS OF THE MADRAS GOVERNMENT.

UNDER date the 13 Dec/76

Read the following :—

From

The Govt. of India (H.E. No. 470 I d/ 2nd Nov /76)

Memo: by Lieut: Rawson R.E. (" " — " 27th — ")

Lieutenant Rawson's Memorandum having furnished all the information regarding the rock at the proposed site for the dam across the Perryaur which can be obtained without a special investigation, and a further examination of value being impracticable without arrangements for clearing jungle and conducting boring operations, which would

would necessarily be costly,
His Grace the Governor
in Council resolves to
transmit a copy of these
Proceedings to the Secretary
of State with a request
that Captain Pennycuick,
who is now in England
on furlough, may be deputed
to make the enquiries sug-
gested by the Govt. of
India. A complete file
of the printed papers
appertaining to the
Perryaur project will
be transmitted for
Captain Pennycuick's
use, together with such
a selection from the draw-
ings as will enable him
to make his report com-
plete.

A

23 9

2. A copy of these Proceedings will be forwarded for the information of the Government of India.

(H. E. Docket No. 3399 d/ 13 Decr 76.

Copy of the above forwarded to the Govt. of India.

Appd. [illegible] 7/12

1 - Copy to the Rev Bd Office 18/4/72
2 - copies to do do 19/4/72

Capt Pennycuick R.E. ~~[illegible]~~ Given to T. Moottoosawmy Pillay - 3 - [illegible] 77
Chief Eng. for Irrig. ~~[illegible]~~
D.E. Madura
Lt. Rawson R.E. through D.E. Nellore.

Despd - 11 - 1 - 77

[illegible]

11-2-18.3.11

Govt. of {1876} Madras
PUBLIC WORKS.

To Captain Pennycuick R.E.

Dated
Issued
Recd. Encl.

G. O., 13th Decr 1876, No. 2398 / 2399

Nos. 310 - 318 / 319

Periyaur Project Madura Dist — Capt. Pennycuick R.E. — to be deputed to Europe and America in connection with the —

Forwarding copy of Rept. on the proposals to depute Capt. Pennycuick R.E. to Europe and America in connection with the Periyaur Project Madura Dist.

Sent to Reg.